SCIENTIFIC AND STATISTICAL COMMITTEE STATEMENT ON PACIFIC WHITING MANAGEMENT

Dr. Martin Dorn, Scientific and Statistical Committee (SSC) representative on the whiting Stock Assessment and Review (STAR) Panel, gave an overview of the STAR Panel report. Dr. Thomas Helser, lead assessment scientist on the Stock Assessment (STAT) Team, was also present for SSC deliberations and responded to questions concerning the assessment. Mr. Jeff Fargo gave a Canada Department of Fisheries and Oceans perspective on the assessment. Mr. Fargo noted that recruitment to the stock since 1999 is apparently very low, and that stock size is projected to decline 55% in the next three years. Regarding the appropriateness of models with survey catchabilities (q) of 1.0 and 0.6, Mr. Fargo noted that many parameters are affected by a change in the value that is assumed for survey catchability, and the behavior of the whiting model is complex. Mr. Fargo underscored the importance of taking a risk-averse approach to managing whiting.

The SSC accepts the STAR Panel conclusion that acoustic survey catchability (q) is the major source of uncertainty in the whiting assessment. Catchability is a critical assessment parameter that determines the scaling of survey estimates to population biomass. Although all previous whiting assessments have been based on the assumption that q=1.0, the current assessment brought forward two models (q=1.0 and q=0.6) to provide plausible lower and upper bounds on uncertainty.

The unconstrained model estimate of q was approximately 0.3, which was considered implausible by the STAR Panel. Consideration of the likely lower and upper bounds on selected components of acoustic survey q suggested that catchability could be bounded by range q=0.55-1.3. While development of a prior for acoustic survey q is a substantial improvement in the whiting assessment, the SSC is concerned these ranges were put together rapidly during the review meeting. A more thorough and systematic approach to developing a prior for acoustic survey q using Monte Carlo simulations would increase confidence in the approach. A more structured approach would also allow focused research on the major components of catchability (such as acoustic target strength) to be included in the assessment. The SSC also has reservations about the process used to select models with q=1.0 and q=0.6. While q=0.6 is slightly above the lower bound of q=0.55, similar considerations should have resulted in a q=1.25 for the upper bound, not q=1.0. In addition, the SSC is concerned that emphasis on upper and lower bounds does not take into account the greater likelihood that the true value is in the center of the range.

Estimates of stock depletion in 2003 ranged from 47% to 51% of unfished spawning stock biomass. Therefore, regardless of which model is correct, Pacific whiting is estimated to be above the rebuilding target of $B_{40\%}$. The Council may want to consider a request that National Marine Fisheries Service (NMFS) re-evaluate Pacific whiting's status as an overfished stock in light of the current assessment.

The SSC recommends the decision table (Table 13 in the stock assessment, Exhibit E.5.a) be used to evaluate the consequences of alternative optimum yield (OY) options for 2004. In this table, three-year projections of stock biomass and depletion are given when management actions are based on the q=0.6 or q=1 model, and the true state of nature is either consistent with that decision or not. Of particular interest are the lower left and upper right diagonal entries in the table, where management actions are based on assuming the incorrect model. When the OY is based on the q=0.6 model, and the true state of nature is the q=1.0 model, it is possible to reduce the stock to 18% of unfished biomass by 2006.

Although significant declines in stock size are projected for 2004-2006 for all scenarios in Table 13, actual declines will be reduced if the entire OY is not harvested, as is likely due to bycatch constraints. This possibility is considered in Table 13 by including scenarios with a constant U.S. catch of 250,000 tons in 2004-2006, while the Canadian catch was assumed to be the Canadian share of the $F_{40\%}$ OY. Since runs based on assuming the incorrect state of nature were not included in the table, the SSC requested that Dr. Helser do these two runs and report back to the SSC. If management actions are incorrectly based on a q=0.6 model (i.e., the true state of nature is q=1.0), there is a greater than 50% chance the stock will decline below the overfished threshold in 2006. In contrast, if management actions are based on q=1.0 model, the stock has a greater than even chance of being above the overfished threshold in 2006 regardless of the true state of nature.

Finally, the SSC notes that presentation of uncertainty by means of two contrasting models does not facilitate the council decision-making process. Current Terms of Reference for STAR Panels do not request the Panel to endorse a single model. Terms of Reference will be revised to give greater emphasis and guidance for selecting a preferred model. However, an important task of the STAR Panel is appraisal of assessment uncertainty, a responsibility that may preclude the Panel from unduly limiting model alternatives.

PFMC
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